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of the Middle Jura, but the occurrence of Lias in the same region shows that Neumayr's hypothesis of a great transgression of the sea in Middle Jurassic time in the arctic region will not hold good. Marine deposits existed there even before Jurassic time, as shown by the occurrence of Upper Triassic deposits in Alaska.

J. P. S.

The Permian of Armenia.¹—The strata of Djulfa in Armenia are classic in geological literature, having long ago been assigned to the Subcarboniferous on account of the supposed occurrence of *Goniatites striatus*. But a revision of the fauna, based on a new collection made by Prof. F. Frech, shows that these beds belong to the Permian, for there is a mixture of Paleozoic and Mesozoic types. Their Paleozoic age is shown by the occurrence of typical Permian brachiopods, such as are known in Russia and India, and of the goniatite genus *Gastrioceras*, which has never been found above the Permian. On the other hand, the genera *Hungarites* and *Otoceras* are known there, which elsewhere are not found below the Trias. The evolution of *Hungarites* from the simple forms of Armenia into the complex development as known in the Trias of Siberia and India is worked out by Dr. von Arthaber in a most convincing manner, and is a good argument against useless multiplication of generic names in a phylogenic series.

J. P. S.

Notes.—Dr. Diener (*Beitr. Palaeontol. Oesterreich-Ungarns*, Bd. XIII, 1900) has continued his detailed studies of the Triassic faunas in this contribution, treating of the Muschelkalk zone of *Ceratites trinodosus*. He describes a new genus, *Arthaberites*, of the family Pinacoceratidæ, resembling *Pseudosagoceras* Diener of the Lower Trias of Siberia, and possibly descended from it. The fauna described shows a strong resemblance to that of the Bosnian Muschelkalk long since made known by the works of F. von Haner. It consists of numerous species of *Ceratites*, *Analcites*, *Celtites*, *Proarcestes*, *Joannites*, *Procladiscites*, *Megaphyllites*, *Sagoceras*, *Arthaberites*, *Pinacoceras*, *Norites*, *Monophyllites*, *Sturia*, *Gymnites*, *Ptychites*, *Nautilus*, *Orthoceras*, *Atractites*. Many of these species had not before been found in the Alps, and their discovery is of material aid in correlating the Alpine strata with those of the other Triassic provinces.

¹ Arthaber, G. von. Das jüngere Palaeozoicum aus der Araxes-Enge bei Djulfa, *Beiträge zur Palaeontologie Oesterreich-Ungarns und des Orients*, Bd. xii (1900), Nr. 4.

Dr. Whiteaves (*Geol. Survey of Canada*, Vol. I, Part IV) revises his published papers on the paleontology and stratigraphy of the Queen Charlotte Islands, many old species being renamed, as further studies have shown their designations to be untenable. Several new species of brachiopods and Mollusca have been obtained by later collectors and are added in this paper. Among the ammonites may be noted the predominance of *Desmoceras* and *Olcostephanus*, also the absence of *Baculites* and *Pachydiseus*, which are characteristic of the Cretaceous of Vancouver Island. The faunas here described seem to include both Knoxville and Horsetown beds of the Californian section, as shown by such characteristic species as *Phylloceras knoxvillense* Stanton, *Lytoceras batesi* Trask, *L. sacya* Forbes, *Desmoceras breweri* Gabb, *D. haydeni*, and *Aucella crassicolis* Keyserling.

The revision of the nomenclature will be exceedingly acceptable and useful to students of West-Coast stratigraphy.

Dr. Sokolow (*Mem. Comité Geol. St. Petersburg*, Vol. IX, No. 5, 1899) has made an interesting study of the brackish-water basin fauna that lies immediately between the Mediterranean stage of the lower Miocene and the Sarmatic stage of the middle Miocene Tertiary of Russia. The Mediterranean stage represents the deposits of the disappearing ancient Mediterranean Sea, and the Sarmatic beds are the deposits of the ancient Black Sea. In this paper we have a study of the fauna transitional between the two epochs and the two basins. In consequence of this the fauna is a mixed one, showing both marine and brackish-water types, due to the rapidly changing physical geography and the development of the extensive brackish-water seas that covered southern Russia in later Miocene time.

Most students of the Triassic paleontology of the Alps occupy themselves with the cephalopods, while the other groups are neglected. But Dr. Kittl (*Ann. k. k. Naturhist. Hof-Museum, Wien*, Bd. XIV, Nr. 1, 2) has given an elaborate revision of the gastropods of the classic St. Cassian beds of the southern Alps, describing many new species and making known a rich fauna. The detailed stratigraphy and correlation of these beds are taken up, and much new light is thrown on the relations of the various fossiliferous horizons of the southern Alps.

In the *Bulletin* of the Harvard Museum of Comparative Zoölogy Mr. C. R. Eastman gives descriptions and figures of two species of extinct gar pikes, *Lepidosteus atrox* Leidy and *L. simplex* Leidy, from

the Eocene Green River shales of Wyoming. Most of the fossil gar pikes of America have been hitherto known from bare fragments scantily described. Mr. Eastman's specimen of *L. atrox* is especially complete, as large as an alligator gar, and very much like it in appearance. In fact it "lacks any positively archaic features," and Mr. Eastman regards it as "obviously the direct progenitor of the alligator gar, *L. tristychus*." Mr. Eastman finds no trace of the earlier ancestry of *Lepidosteus*. The gar pikes "blossom forth suddenly and fully differentiated at the dawn of the Tertiary without the least clue to their ancestry, unheralded and unaccompanied by any intermediate forms, and they have remained essentially unchanged ever since."

In the *Bulletin* of the Kansas University, Vol. I, No. 2, Prof. S. W. Williston describes and figures many teeth of sharks found in the Cretaceous rocks of Kansas, his paper being a very useful contribution to this difficult branch of paleontology. In the matter of nomenclature, apparently, Agassiz's name, *Oxyrhina*, should not be used instead of the earlier *Isurus* of Rafinesque, and *Scylliorhinus* of Blainville has unfortunately clear priority over *Scyllium* Cuvier.

PETROGRAPHY.

Geology of the Black Hills.—Irving's contribution to the geology of the Northern Black Hills adds a great deal to our knowledge of this interesting region, especially from the point of view of petrography. The author agrees with Crosby, rather than with Russell, in regarding the larger intrusives of the district as laccolites and not as plugs. He finds also an abundance of sills and dikes. The dikes characterize the Algonkian slates, the sheets and laccolites the Cambrian shales. The Carboniferous limestone is almost devoid of intrusions of any kind. The principal types of rocks recognized are a quartz-ægirite-porphyry, tinguaitite, phonolite, trachytoid-phonolite, quartz-porphyry, mica-diorite-porphyry, dacite, tonalite, and augite-vogesite. The phonolites and quartz-porphyries are the most abundant types, with the quartz-ægirite-porphyries and the diorite-porphyries fairly abundant. There is such an intimate gradation between the different types that they appear to be related genetically. In the pre-Cambrian rocks, dikes and possibly plutonic